

**Case Study**

**Yamal LNG Project**



# Case Study: Yamal LNG Project

After several years of intensive planning, engineering and execution, the various teams of deugro have managed one of the largest and most complex liquefied natural gas (LNG) projects ever executed.

### The location and challenge

Yamal is an LNG project located deep in the Russian Arctic, a region that is ice-bound for seven to nine months during the year and where the sun remains beneath the horizon for three months at a time. During the winter, temperatures of -40°C are common in this region located above the Arctic Circle.

### Scope of work and project execution

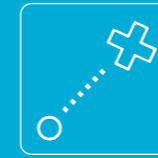
Over a period of four years, deugro transported 850,000 freight tons in total from all over the world to the job site in Russia or to fabrication yards in China, Indonesia and the Philippines, as well as to Belgium for cargo consolidation.

More than 17,500 single shipments were shipped by all possible transportation modes, including air and ocean full charters, to various

» The combination of air, road and ocean transportation modes was necessary to deliver urgently required material in time. «



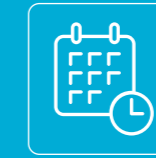
**Total Volume**  
850,000 FRT,  
over 17,500  
single  
shipments



**Remote Location**  
Deep in the  
Russian Arctic



**Global Project**  
Teams of over  
10 countries  
involved



**Project Duration**  
4 years of  
planning and  
execution



**Cargo Highlight**  
Heavy heater  
module, 860 MT,  
39 x 18 x 35 m



Loading operations in the Russian Arctic

destinations around the world such as Sabetta in the Arctic North. A specialized heavy lift vessel was used together with ice breakers to ensure a safe passage. Along with experience gained dealing with local authorities to receive special permission, we have gained competence and know-how that not every project freight forwarder can offer.

# Project Execution

## Project highlights

- Shipping through the Northern Sea Route
- Cargo weight of 860 MT, with a size of 39 x 18 x 35 m
- Over a period of four years, deugro transported 850,000 FRT in total from all over the world to Russia, China, Indonesia, the Philippines and Belgium.
- More than 17,500 single shipments, shipped by air, ocean and road, to various destinations around the world, including Sabetta in the Arctic North
- Eight sea voyages shipping a total of 98,350 cbm
- Additionally deugro shipped another 227,845 cbm, utilizing 24 sea voyages for other projects via the same NSR

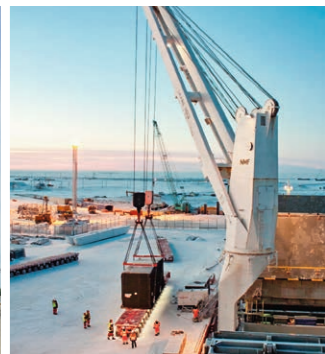
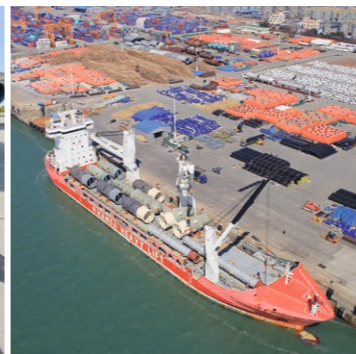
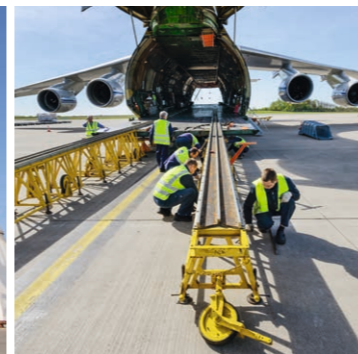
## Air transportation

As well as the traditional transportation mode by water, deugro had to arrange, coordinate and manage various full air freight charters.

Different specialized aircraft types, including the Antonov 124 and Ilyushin 76, were chartered to transport urgent material

from the origin airports—such as Frankfurt-Hahn, (Germany), Liège, Belgium and Dalian, China—directly to Sabetta Airport in northwest Siberia.

Additionally, scheduled B-747 freighter services from Singapore to Frankfurt am Main and Shanghai to Amsterdam had to be arranged for the urgent cargo to be transported by road to the Port of Zeebrugge in the Netherlands, where it was to continue its journey by ocean to the final destination in Sabetta.



## Intra-China transportation

Approximately 150,000 freight tons of air-cooled heat exchangers and accessories had to be transported within China itself—from Changzhou, which is situated just north of Shanghai, to the respective module yards in Qingdao and Penglai much further to the north. The largest air coolers were 20 x 8 x 6 meters in size, each with a weight of 85 metric tons. In total, 35 vessel trips were required to complete the movement of this cargo alone.

Due to intra-China transportation, only Chinese flag vessels could be used, which also had to comply with international insurance requirements and HSE standards.

## Ocean Transportation from Spain to Russia

A heavy heater module of 860 metric tons, with dimensions of 39 x 18 x 35 meters, was shipped from Gijon, Spain by a specialized heavy lift RO/RO vessel directly to Sabetta, Russia. This shipment alone took 15 months of engineering preparation and planning with the engineering team of dteq Transport Engineering Solutions (dteq) and chartering specialists.

The furnace's structural integrity itself was rather low, which presented a great challenge to the team.

The design of the sea-fastening and the load spreading on board the vessel was mainly driven by the time of year and sailing through the Bay of Biscay, France, notorious for its treacherous weather conditions. This naturally also had to be taken into consideration.

40-meter-high HVAC heater  
being loaded onto the vessel

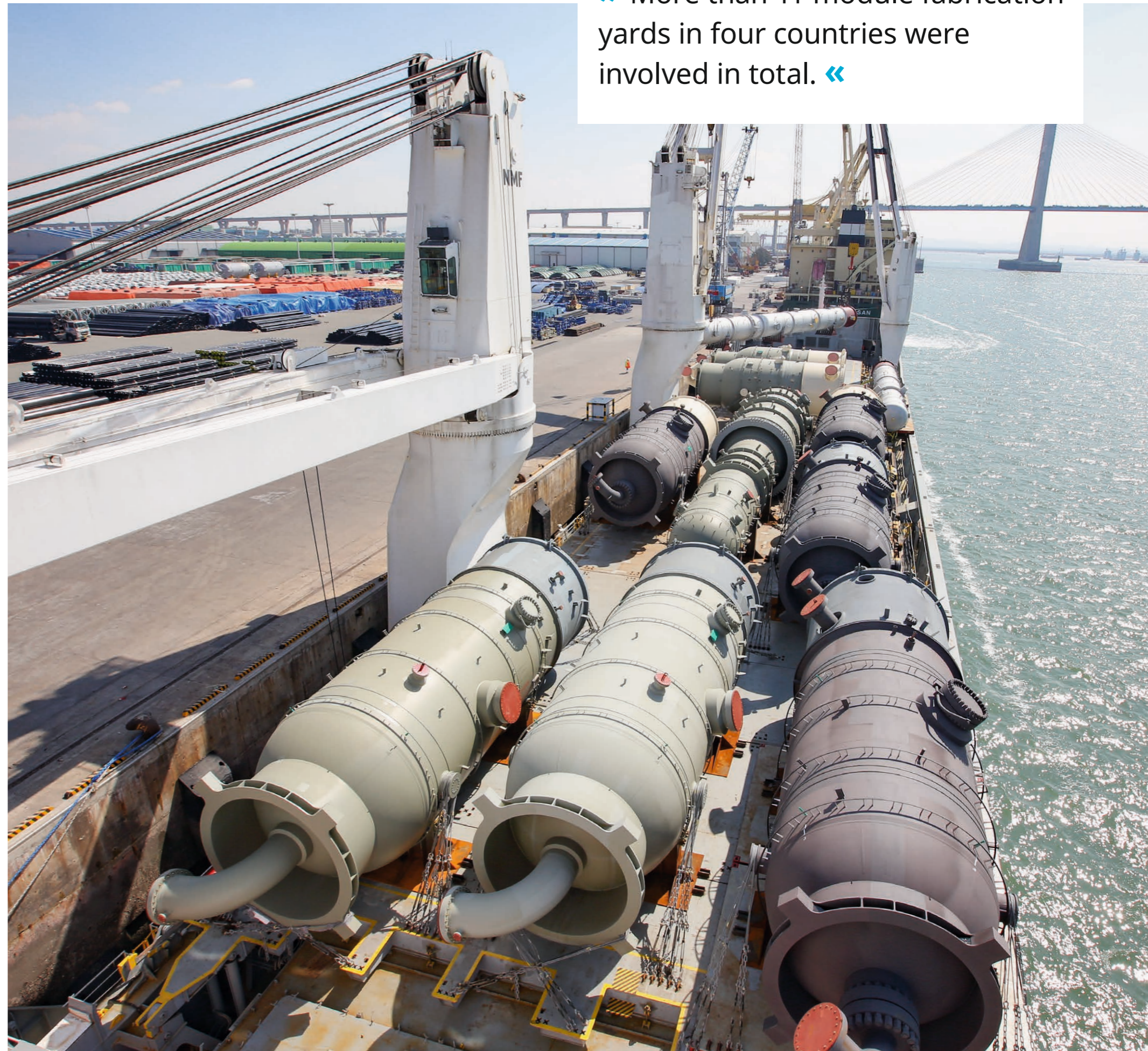


## How We Solved the Challenge

Due to the project location, extremely harsh weather conditions and limited existing infrastructure, our client chose a modular transportation concept. To be able to perform the project on time, more than 11 module fabrication yards in four countries were involved in total with arranging cargo deployments. At the same time, cargo was shipped directly from its origin to Sabetta in Russia's Arctic and the closest port to the Yamal construction site. Cargo was also consolidated from all around the world in the Port of Zeebrugge, Belgium so that chartered vessels could cost-effectively and flexibly transport cargo to its final destination.

The centralized project control tower was based in Hanau, Germany, with regional and dedicated project teams around the world. Furthermore, the project was highly supported by deugro's sister company dteq and our specialized in-house support functions, such as QHSES, Chartering and IT.

» More than 11 module fabrication yards in four countries were involved in total. «





CAD-based 3D simulation of the HVAC heater

## 3D Animation

Yamal LNG was executed with the help of a CAD-based 3D simulation developed by deugro, which aims to show our clients exactly how their cargo will be transported and how any risks can be dealt with on site.

During the planning phase of the Yamal LNG Project, dteq's transport engineers were able to present several possible outcomes and, most importantly, discard impractical solutions immediately. Accurate planning, efficiency, risk avoidance, and optimized costs for loading and offloading are all reasons why the 3D transport simulation service is a great addition to what deugro has to offer.

**Experience the complete transportation and watch the project videos on YouTube:**  
[deugro - Yamal LNG Project](#)  
[deugro - 3D Transport Simulation](#)

» Not every project freight forwarder can offer the experience and know-how that deugro can. «

This greatly enhances the quality and accuracy of the services we offer and complements our transparent business practices. The simulation service also makes the project planning phase more efficient.



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